

REMARKS

Applicants have canceled claims 3, 5, 9, and 12, without prejudice or disclaimer of their subject matter, and amended claims 1, 7, and 10 to more appropriately define the present invention. Claims 1, 2, 4, 6-8, 10, 11, and 13-26 remain pending, with claims 13-26 withdrawn from consideration as drawn to a nonelected invention, and claims 1, 2, 4, 6-8, 10, and 11 under current examination.

Regarding the Office Action:

In the Office Action, the Examiner rejected claims 1 and 5-7 under 35 U.S.C. § 102(b) as being anticipated by Katsumi et al. (Japanese Patent Application Publication No. 11074472) (“Katsumi”); rejected claims 2, 3, 9, and 10 under 35 U.S.C. § 103(a) as being unpatentable over Katsumi in view of Wolf, “Silicon Processing for the VLSI Era, Volume 2: Process Integration,” 1990, pp. 435 and 273-275 (“Wolf”); and rejected claims 4 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Katsumi in view of Wolf and Vossen et al., “Thin Film Processes II,” 1991, pp. 178, 197, and 201 (“Vossen”). Applicants traverse the rejections for the following reasons.¹

Rejection of Claims 1 and 5-7 under 35 U.S.C. § 102(b):

The rejection of claim 5 has been rendered moot by the cancellation of this claim.

Applicants traverse the rejection of claims 1 and 5-7 under 35 U.S.C. § 102(b) as being anticipated by Katsumi. Applicants respectfully disagree with the Examiner’s arguments and conclusions.

¹ The Office Action contains statements characterizing the related art, case law, and the claims. Regardless of whether any such statements are specifically identified herein, Applicants decline to automatically subscribe to any statements in the Office Action.

In order to properly establish that Katsumi anticipates Applicants' claimed invention under 35 U.S.C. § 102, each and every element of each of the claims in issue must be found, either expressly described or under principles of inherency, in that single reference. Furthermore, “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.” See M.P.E.P. § 2131, quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Katsumi does not disclose each and every element of Applicants' claimed invention, despite the Examiner's allegations. In the rejection, the Examiner alleged that “Katsumi teaches forming a wiring layer (40) and a first insulating film (42) on the wiring layer in a plasma of not more than 1% hydrogen in all gasses (paragraph 0047, SiH₄ about 1% and NH₃ about 5%, to total about 6%, results in about 1% total hydrogen in all gasses” (Office Action, p. 2).

It is clear, however, that Katsumi does not disclose each and every element of Applicants' independent claim 1. Applicants' independent claim 1, as amended, calls for “forming a first insulating film on the wiring layer under a condition that hydrogen in a plasma is not more than 1% in all gas components, the first insulating film not containing hydrogen.” Formed under these conditions, the first insulating film does not contain any hydrogen. This is supported by the originally-filed specification at, for example, p. 6, lines 19-22. In contrast to the claimed invention, however, Katsumi's first insulating film 42 contains hydrogen, as described, for example, in the English-language Abstract (“hydrogen concentration in the passivation film 42 is set at a low value”) and in par. 0047 of the specification (referring to Figs. 5(a) and 6(a) and providing volume concentrations of hydrogen-containing film forming gases). Since Katsumi's first insulating film 42 contains hydrogen, Katsumi cannot disclose each and every element of Applicants' independent claim 1.

Katsumi therefore does not anticipate Applicants' independent claim 1. Independent claim 1 is therefore allowable, for the reasons argued above, and dependent claims 6 and 7 are also allowable at least by virtue of their dependence from allowable base claim 1. Therefore, the improper 35 U.S.C. § 102(b) rejection of claims 1 and 5-7 should be withdrawn.

Rejection of Claims 2, 3, 9, and 10 under 35 U.S.C. § 103(a):

The rejection of claims 3 and 9 have been rendered moot by the cancellation of these claims.

Applicants traverse the rejection of claims 2, 3, 9, and 10 under 35 U.S.C. § 103(a) as unpatentable over Katsumi in view of Wolf. Applicants disagree with the Examiner's arguments and conclusions. A *prima facie* case of obviousness has not been established.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)." M.P.E.P. § 2142, 8th Ed., Rev. 2 (May 2004), p. 2100-128.

In the rejection, pertaining to claim 2, the Examiner admitted that "Katsumi is silent as to the thickness of the underlying gate oxide (gate insulating film)" (Office Action, p. 5). The Examiner then cited Wolf to allegedly cure this deficiency in Katsumi ("Wolf teaches that gate oxides are becoming smaller, and that 5 nm (50 angstroms) is a typical gate oxide thickness (page 435)" (Office Action, p. 5)).

In the rejection, pertaining to claim 10, the Examiner admitted that "Katsumi is silent as to the temperature of forming the layer" (Office Action, p. 6). The Examiner then cited Wolf to

allegedly cure this deficiency in Katsumi (“Wolf teaches this to be about 300 degrees C. (page 274)” (Office Action, p. 6)).

The Examiner’s only argument for combining Katsumi and Wolf is that “it would be obvious to [...] modify Katsumi by using a typical gate oxide (gate insulator) thickness as taught by Wolf, and to use typical deposition temperatures rather than to spend research time and money to (re)develop what is known in the conventional art” (Office Action, p. 6).

None of the Examiner’s allegations, however, address the fact that the citations to Wolf do not cure the deficiencies of Katsumi as they pertain to independent claim 1. That is, the Examiner has not established a *prima facie* case of obviousness because Katsumi and Wolf, taken alone or in combination, fail to teach or suggest at least Applicants’ claimed “forming a first insulating film on the wiring layer under a condition that hydrogen in a plasma is not more than 1% in all gas components, the first insulating film not containing hydrogen” (independent claim 1).

In addition, the Examiner has not shown that one of ordinary skill in the art would have been motivated to combine Katsumi and Wolf, viewing only teachings from within these references themselves, in a manner resulting in Applicants’ claimed invention. Therefore, *prima facie* obviousness also has not been established because the requisite motivation to modify Katsumi and Wolf, from within the references themselves, is lacking. Determinations of obviousness must be supported by evidence on the record. *See In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001) (finding that the factual determinations central to the issue of patentability, including conclusions of obviousness by the Board, must be supported by “substantial evidence”). Further, the desire to modify a reference must be proved with “substantial evidence” that is a result of a “thorough and searching” factual inquiry. *See In re Lee*, 277 F.3d 1338,

1343-1344 (Fed. Cir. 2002) (quoting *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52).

In the rejection, the Examiner has not shown that one of ordinary skill in the art, when considering Katsumi and Wolf, and not having the benefit of Applicants' disclosure, would have been motivated to modify and/or combine these references in a manner resulting in Applicants' claimed invention. The Examiner generally alleged that "[i]t would have been obvious..." (Office Action, p. 6). The Examiner's allegation that "it would have been obvious" is not properly supported by substantial evidence, and further allegations that one would not "spend research time and money" (Office Action, p. 6) are specious at best, and do not explain how one of ordinary skill in the art would have modified Katsumi and Wolf to produce all the elements of independent claim 1, from which claims 2 and 10 depend. The Examiner provides no evidence, beyond these general allegations in an attempt to show that one of ordinary skill in the art would have been motivated to combine or modify these references to produce the claimed invention.

Applicants direct the Examiner's attention to M.P.E.P. § 2143.01, which makes clear that: "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination" (citations omitted). Thus, the Examiner has not shown that Katsumi or Wolf "suggests the desirability" of the alleged combination. Thus, there would be no motivation to combine these references. For at least these additional reasons, *prima facie* obviousness has not been established regarding independent claim 1, and hence dependent claims 2 and 10.

The Examiner's reliance on Katsumi and Wolf fails to establish *prima facie* obviousness of independent claim 1. Independent claim 1 is therefore allowable, for the reasons argued

above, and dependent claims 2 and 10 are also allowable at least by virtue of their dependence from allowable base claim 1. The improper 35 U.S.C. § 103(a) rejection should be withdrawn.

Rejection of Claims 4 and 8 under 35 U.S.C. § 103(a):

Applicants traverse the rejection of claims 4 and 8 under 35 U.S.C. § 103(a) as unpatentable over Katsumi in view of Vossen. Applicants disagree with the Examiner's arguments and conclusions. A *prima facie* case of obviousness has not been established.

In the rejection, pertaining to dependent claims 4 and 8, the Examiner admitted that Katsumi does not teach "alternative methods for forming the layer as well as its forming temperature" (Office Action, p. 6). The Examiner then cited Vossen to allegedly cure this deficiency in Katsumi ("Vossen teach this layer (a SiO₂ layer) may be formed by sputtering (page 197)" (Office Action, p. 7), and "Vossen teaches that sputtering is a cold deposition with the only heat being supplied by ion impact at the target" (Office Action, p. 7)).

The Examiner's only argument for combining Katsumi and Vossen is that "it would be obvious to [...] modify Katsumi by using sputter deposition as taught by Vossen to yield excellent film uniformity" (Office Action, p. 7).

None of the Examiner's allegations, however, address the fact that the citations to Vossen do not cure the deficiencies of Katsumi as they pertain to independent claim 1. That is, the Examiner has not established a *prima facie* case of obviousness because Katsumi and Vossen, taken alone or in combination, fail to teach or suggest at least Applicants' claimed "forming a first insulating film on the wiring layer under a condition that hydrogen in a plasma is not more than 1% in all gas components, the first insulating film not containing hydrogen" (independent claim 1).

In addition, the Examiner has not shown that one of ordinary skill in the art would have been motivated to combine Katsumi and Vossen, viewing only teachings from within these references themselves, in a manner resulting in Applicants' claimed invention. Therefore, *prima facie* obviousness also has not been established because the requisite motivation to modify Katsumi and Vossen, from within the references themselves, is lacking.

The Examiner's allegation that "it would have been obvious" (Office Action, p. 7) is not properly supported by substantial evidence, and does not explain how one of ordinary skill in the art would have modified Katsumi and Vossen to produce all the elements of independent claim 1, from which claims 4 and 8 depend. The Examiner provides no evidence, beyond these general allegations in an attempt to show that one of ordinary skill in the art would have been motivated to combine or modify these references to produce the claimed invention. For at least these additional reasons, *prima facie* obviousness has not been established regarding independent claim 1, and hence dependent claims 4 and 8.

The Examiner's reliance on Katsumi and Vossen fails to establish *prima facie* obviousness of independent claim 1. Independent claim 1 is therefore allowable, for the reasons argued above, and dependent claims 4 and 8 are also allowable at least by virtue of their dependence from allowable base claim 1. The improper 35 U.S.C. § 103(a) rejection should be withdrawn.

Allowable Subject Matter:

Applicants acknowledge the Examiner's indication that claims 11 and 12 contain allowable subject matter, and note that claim 12 has been cancelled, without prejudice or disclaimer of its subject matter.

Conclusion:

In view of the foregoing, Applicants request reconsideration of the application and withdrawal of the rejections. Pending claims 1, 2, 4, 6-8, 10, and 11 are in condition for allowance, and Applicants request a favorable action.

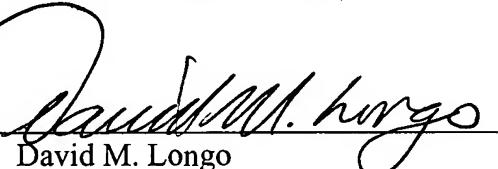
If there are any remaining issues or misunderstandings, Applicants request the Examiner telephone the undersigned representative to discuss them.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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